

CLAIMS

What is claimed is:

1. A photomultiplier tube comprising:

5 a cathode (3) emitting electrons in response to incident light;

a plurality of dynodes (107) multiplying electrons emitted from the cathode; and

10 potential regulating means (115, 215, 315, 319, 323) disposed in a prescribed position in relation to an edge of a first dynode (107a) positioned in a first stage from the cathode and an edge of a second dynode (107b) positioned in a second stage from the cathode, and smoothing an equipotential surface in a space between the first dynode 15 (107a) and the second dynode along a longitudinal direction of the first dynode (107a).

2. The photomultiplier tube as claimed in Claim 1, wherein the potential regulating means is a plate-shaped electron lens forming electrode (115, 215, 315, 323) 20 disposed between the edge of the first dynode (107a) and the edge of the second dynode (107b) and arranged substantially parallel to a side wall of the first dynode (107a) and separated from the first dynode (107a); and

25 a voltage is applied to the electron lens forming electrode (115, 215, 315, 323) to produce a higher potential

than the potential of the first dynode (107a).

3. The photomultiplier tube as claimed in Claim 2,
wherein the electron lens forming electrode (115, 215) is
electrically connected to an edge of a third dynode (107c)
5 positioned in a third stage from the cathode.

4. The photomultiplier tube as claimed in Claim 2,
wherein the electron lens forming electrode (315, 323) is
separated from the plurality of dynodes (107).

5. The photomultiplier tube as claimed in any of
10 Claims 2 through 4, further comprising a second electron
lens forming electrode (115, 215, 319) disposed between an
edge of the second dynode (107b) and an edge of the third
dynode (107c) and arranged substantially parallel to the
electron lens forming electrode (115, 215, 315) and
15 separated from the second dynode; and

wherein a voltage is applied to the second electron
lens forming electrode (115, 215, 319) to produce a higher
potential than the potential in the second dynode (107b).

6. The photomultiplier tube as claimed in Claim 5,
20 wherein the second electron lens forming electrode (115,
215) is integrally formed with the electron lens forming
electrode (115, 215).

7. The photomultiplier tube as claimed in any of
Claims 2 through 6, wherein the cathode (3), the dynodes
25 (107), and the lens forming electrode (115, 215, 315, 319,

323) are disposed in a hermetically sealed vessel (1) that is cylindrical in shape and sealed on both ends;

the light enters the hermetically sealed vessel (1) from one end thereof;

5 the dynodes (107) are concave and substantially arc-shaped, the first dynode (107a) opening substantially toward the one end of the hermetically sealed vessel (1), the second dynode (107b) opening substantially toward another end of the hermetically sealed vessel (1), and the third 10 dynode (107c) opening substantially toward the one end of the hermetically sealed vessel (1), and the electrons impinge on and are emitted from inner surfaces of the dynodes (107); and

15 the lens forming electrode (115, 215, 315, 323) forms a fan shape that follows the concave shape of the first dynode (107a) when viewed in a cross section along a direction orthogonal to the inner surfaces of the first 20 dynode (107a), second dynode (107b), and third dynode (107c).